

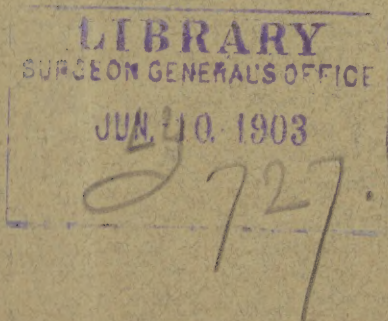
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THE FRONTAL AND ETHMOIDAL SINUSES
WITH EXOPHTHALMOS; OPERATION; RE-
COVERY.

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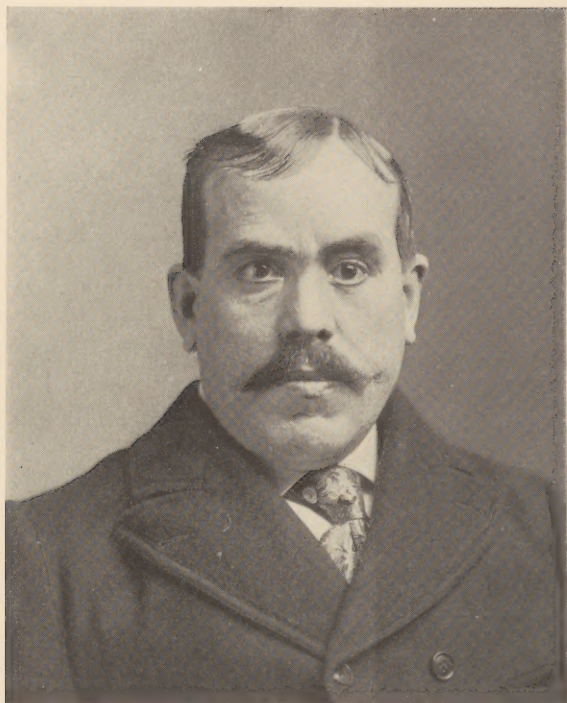
ARNOLD H. KNAPP, M.D.

(With a figure on Text-Plate I.)



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Case of chronic empyema of the frontal and ethmoidal sinuses
with exophthalmos.

Photograph taken eight months after operation.

A CASE OF EXTENSIVE CHRONIC EMPYEMA OF THE FRONTAL AND ETHMOIDAL SINUSES WITH EXOPHTHALMOS; OPERATION; RECOVERY.

By ARNOLD H. KNAPP, M.D.

(With a figure on Text-Plate I.)

S. R., thirty-five years of age, came to the Dispensary of the New York Ophthalmic and Aural Institute on February 25, 1898, complaining of protrusion of his left eye and a discharge from the nose, of one year's duration.

On examination, an exophthalmos was very noticeable ; the eye not only protruded, but was displaced down and out. The upper lid was thickened and drooped, covering a soft swelling in the upper part of the orbit. Pressure on this swelling caused thick pus to appear in the left nasal passage. The mobility of the eye was restricted, the vision normal. Ophthalmoscopic examination revealed venous congestion of the retina. On examining the nose, the left middle turbinate was found hypertrophied and pressed against the septum. The middle meatus contained polypoid masses and thick offensive pus. The probe detected extensive necrosis of the ethmoidal cells. Exploratory puncture of the left maxillary antrum proved negative. The patient otherwise appeared to be in excellent health ; there was no evidence of an intracranial complication, nor of any constitutional disease.

A futile attempt was made to improve the nasal condition by removing the hypertrophic masses in the middle meatus and curetting the ethmoidal cells, but the disease was found to be too extensive, and the external operation was immediately decided upon.

On March 5th, under ether-anæsthesia, the left nasal passage was plugged posteriorly to prevent the entrance of pus or blood

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into the pharynx during the operation. The incision commencing at the external angular process was carried along the supraorbital arch to the root of the nose, and then vertically down to the internal palpebral ligament. In completing the incision down to the periosteum at the orbital margin an abscess cavity was opened, and a large quantity of very offensive pus evacuated. The finger, introduced into this opening, entered a large cavity extending deep into the orbit, limited anteriorly by a sharp rough edge of bone. The periosteum was readily elevated from the inner bony wall and what was left of the upper wall of the orbit. The soft orbital contents were then retracted, exposing the entire inner and upper walls nearly to the apex of the orbit. The frontal sinus extended across the roof of the orbit; its lower wall was extensively necrosed showing a round defect of 2.5 *cm* in diameter. After removing the remainder of this lower wall up to the supra-orbital margin which was left intact, the upper wall of the sinus could be thoroughly explored, and presented no evidence of necrosis. The structures at the inner wall of the orbit were extensively diseased; the ethmoid labyrinth consisted of a mesh-work of necrotic bone and granulations. These were carefully removed with the sharp spoon and the bone forceps, so that the defect comprehended the lower part of frontal sinus, the adjoining part of the lacrymal bone and the entire os planum of ethmoid, exposing a small area of healthy dura above, at the floor of the anterior cranial fossa. A wide opening was thus made into the nose, laying bare the entire middle meatus. As the sphenoidal cells are often affected in ethmoid disease, the anterior wall of the sphenoidal sinus was opened, but the sinus proved healthy. Finally, attention was directed to the remaining part of the frontal sinus, *i. e.*, the anterior and upper walls and the septum. The septum contained a smooth-walled perforation, freely communicating with the frontal sinus of the opposite side. The latter sinus, however, as far as could be ascertained with the probe, was not particularly affected. The posterior surface of the anterior wall of the left frontal sinus, which was quite long, and the adjoining portion of the roof, were very carefully curetted under guidance of the touch. This was the only part of the field of operation which was not accessible to direct inspection, as it is desirable for cosmetic reasons not to encroach upon the anterior wall representing the supraorbital arch and the superciliary ridge. The entire wound was packed with iodoform gauze.

The patient's recovery from the operation was speedy and uneventful. Some inconvenience was caused during the first days by swelling of the lids and conjunctiva. The nose was irrigated at regular intervals. No especial discharge, and no fever. The packing was changed on the third day, and thereafter on alternate days. The amount of packing was gradually diminished as the soft parts of the orbit rose to fill up the cavity. The exophthalmos steadily decreased. The eye was unaffected. The wound healing progressed favorably until March 22d, four days after the patient's discharge from the hospital, when an attack of facial erysipelas set in, which lasted about nine days. The wound had closed with the exception of two openings, one at the outer angle of the orbit, short and leading back, the other, and larger one, at the inner angle, leading up and back and discharging some pus. The latter was purposely kept wide open, though no bare bone could be detected. Two granulating masses were removed from the middle meatus of the nose. The outer wound closed promptly. The one at the inner angle of the orbit progressed favorably, the discharge gradually ceased, and the wound was permanently healed on July 2, 1898, almost four months after the operation.

The exophthalmos has disappeared entirely; the eye, however, is somewhat lower than its partner. Sight, fundus, and mobility, normal. No diplopia, and no ptosis. Below the supraorbital margin, at its inner angle, there is a slightly depressed scar, causing no deformity. (See illustration, taken on Dec. 29, 1898.)

REMARKS.—This method of operating is the one advocated by Jansen. He has described eight cases operated on in this manner.¹ The line of incision permits of the elevation of the periosteum lining the upper and inner walls of the orbit, allowing the exposure of the frontal, ethmoidal, and sphenoidal sinuses. The hemorrhage after the cutaneous incision is free but readily controlled. The trochlea is detached together with the periosteum without causing any, or only, transient interference with its function. Unless the anterior wall of the frontal sinus is necrosed, no part of it need be removed which is essential to prevent any subsequent disfigurement. The frontal sinus can usually be satisfactorily dealt with from its lower and orbital surface; this is also most advantageous as regards drainage. The ethmoid labyrinth

¹ *Arch. f. Laryngologie*, 1894, vol. i., p. 114 and following.

can be thoroughly explored, as it can only be done by way of the orbit, and properly drained by way of the nose. The sphenoidal cavity can be directly inspected. It seems to me that the establishment of perfect drainage is the important step in the entire operation. This is secured by the broad opening into the middle meatus of the nose, requiring, as in our case, the removal of the entire os planum of the ethmoid. Kuhnt¹ removes the anterior wall of the frontal sinus in the usual cases of frontal empyema, and also employs a similar, though less extensive incision along the concavity of the orbital margin at its upper and inner angle, if the sinus is small in size, as shown by transillumination, and if the lower wall of the frontal sinus or the ethmoidal cells are involved. In two cases, Nos. xiii. and xiv., which were operated on according to the latter, or the author's second, method, the anterior and lower walls of the sinus were removed, and the ethmoidal cells curetted. The wound was drained from in front. He considers a broad communication between the wound and the nose to be very undesirable because of the danger of infection from the nose. This danger of infection is, I think, exaggerated, the wound granulates rapidly, and the nasal passage can be kept comparatively clean by frequent irrigation. The deeper parts of so extensive a wound cannot be satisfactorily drained by an opening in the face. Grünwald² has suggested a similar incision and method of procedure from studies on the cadaver. He was not satisfied with the cosmetic results of the Jansen operation and prefers the method of resecting the anterior wall of the sinus.

Many methods, associated with the names of Panas, Ogston-Luc, Czerny, Killian, Golovine, and others, have been proposed, and are being practised, for the treatment of frontal empyema. Uncomplicated cases can be cured by various ways of operating, as a study of the literature shows. It, however, must always be borne in mind that the lower wall of the frontal sinus is the one most apt to be affected, that perforation generally occurs through this wall, and that the adjoining cells of the ethmoid are frequently involved.

¹ *Entzündliche Erkrankungen der Stirnhöhlen*, 1895, p. 208 and following.

² *Die Nasenerkrankungen*, 2d edition, 1896, p. 220.

Jansen even believes that they are always involved in empyema of the frontal sinus, and that they may even be the primary focus. Hence the method which renders these regions most accessible to inspection and operative interference, and provides for the best subsequent drainage should be the one adopted.

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